Amendments to the Claims:

This Listing of Claims will replace all prior versions, and listings, of claims in the application:

1. (Currently Amended) A motion capture system comprising:

at least four stationary radio frequency receivers around a defined area;

a first radio frequency transmitter disposed at ~~a determinable~~ an arbitrary position relative to the receivers;

a plurality of radio frequency transmitters affixed to at least one movable object within the vicinity of the defined area;

the receivers receiving radio frequency signals transmitted by the transmitters; and

a processing system for processing the signals received ~~by~~ from the transmitters to determine positional information regarding the movable object within the vicinity of the defined area, the processing system using signals received from the first transmitter as a reference for determining positions of the transmitters affixed to the movable object relative to the position of the first transmitter at said arbitrary position.

2. (Currently Amended) The system of claim 1 further comprising means for automatically determining said first transmitter position relative to the receivers.

3. (Original) The system of claim 1 wherein the stationary receivers have respective receiver clocks, and the stationary receivers do not have circuitry which synchronizes their receiver clocks from one stationary receiver to another.

4. (Currently Amended) The method of claim ~~1~~ 18 further comprising using said determined position information to position a computer generated object within a motion picture scene.

5. (Currently Amended) The method of claim ~~1~~ 18 further comprising using said determined position information to position a computer generated object within a video game scene.

6. (Currently Amended) The method of claim ~~1~~ 18 wherein the at least one movable object comprises at least two ~~relatively~~ moving objects within a product manufacturing process, and wherein the method further comprises using said determined position information to analyze interaction between said moving objects within said product manufacturing process.

7. (Original) The system of claim 1 wherein the movable object is a motion picture camera, and wherein the plurality of transmitters affixed thereto comprise at least 3 transmitters disposed at positions on the camera sufficient to determine pitch, yaw, and roll of the camera.

8. (Original) The system of claim 7 wherein the motion picture camera is a hand held motion picture camera.

9. (Canceled)

10. (Currently Amended) The system of claim ~~9 wherein the patch is~~ 1 wherein at least one of the transmitters comprises a flexible patch having an adhesive layer on the transmitter covered by the backing layer, the transmitter being activated by removal of the backing layer to expose the adhesive layer leaving the transmitter operational and ready to adhere to an object .

11. (Original) The system of claim 1 wherein each of the transmitters affixed to the object transmits a synchronization code and a tag identification code, the tag identification code being unique to each tag, the synchronization code and the tag identification code being modulated onto a carrier frequency.

12. (Original) The system of claim 11 wherein the synchronization code is OEED hex.

13. (Currently Amended) The system of claim ~~11~~ 1 wherein each of the transmitters affixed to the objects transmits respective ~~the~~ tag identification codes that are selected for low pairwise cross-correlation values.

14. (Currently Amended) The system of claim ~~11~~ 1 wherein each of the transmitters affixed to the objects transmits respective ~~the~~ tag identification codes that are vectors in a binary extended quadratic residue code space.

15. (Currently Amended) The system of claim ~~11~~ 1 wherein each of the transmitters affixed to the objects transmits respective ~~the~~ tag identification codes that represent values produced by the code generator polynomial

$$\prod_{n \in Q} (x-\alpha^n)$$

where Q = {1, 2, 3, 4, 6, 7, 8, 9, 12, 14, 16, 17, 18, 21, 24, 25, 27, 28, 32, 34, 36, 37, 42}

16. (Original) The system of claim 1 wherein the processing system computes respective positions of the transmitters on the object without using any Global Positioning System (GPS) data or inertial sensor data transmitted by the transmitters on the object.

17. (Currently Amended) The system of claim 1 wherein each of the transmitters transmits signals at a transmission rate that is an integer multiple of ~~both 24 transmissions per second and 30~~ 120 transmissions per second.

18. (Currently Amended) The system of claim 1 wherein each of the transmitters attached to the movable object comprises:

a backing layer;

circuitry affixed to the backing layer for generating a radio frequency waveform;

an antenna for transmitting the waveform;

an adhesive applied to the backing layer;

a removable portion applied to the adhesive;

a sensor for detecting when the removable portion is removed; and

a transmitter controller for enabling the device to begin transmitting the radio frequency waveform when the sensor detects that the removable portion has been removed;

wherein when the removable portion is removed the transmitter the transmitter and adhesive layer are left behind such that the transmitter is ready for adhering to an object via the adhesive.

19. (Currently Amended) A method of tracking movement of at least one object, the method comprising:

providing a plurality of radio frequency receivers defining sensors;

providing a first radio frequency transmitter, the first radio frequency transmitter defining a reference tag;

providing a plurality of radio frequency transmitters on the at least one object, the transmitters defining marker tags;

~~determining a position of the reference tag to define a reference tag known position; and~~

at the sensors, determining relative phase information between the signal received from the reference tag and signals received from the marker tags; and

processing the ~~known position of the reference tag and the radio frequency signals received at the sensors from the marker tags and from the reference tag~~ relative phase information determined at the sensors to determine respective positions of the marker tags.

20. (Original) The method of claim 19 wherein the processing includes:

computing respective reference tag pseudorange measurements between the reference tags and the sensors;

computing respective marker tag pseudorange measurements between each of the marker tags and the sensors;

computing respective single differences between the marker tag pseudorange measurement and the reference tag pseudorange measurement for each of the sensors;

computing respective double differences between the single differences for pairs of sensors;

using the double differences to form a set of simultaneous equations; and

solving the simultaneous equations to compute the position of the marker tag.

21. (Original) The method of claim 19 wherein each of the marker tags transmits a synchronization code and a respective tag identification code, the tag identification code being unique to each tag, the synchronization code and the tag identification code being modulated onto a carrier frequency.

22. (Original) The method of claim 21 wherein the processing includes determining a code phase indicating the position of a given marker tag to within a range corresponding to a bit position of said synchronization code.

23. (Original) The method of claim 19 wherein the processing further includes determining a carrier phase, the carrier phase resolving the position of the given marker tag within said bit position to within less than one wavelength at the carrier frequency.

24. (Original) The method of claim 19 further comprising using data produced according to the method to insert computer generated images within a motion picture scene.

25. (Original) The method of claim 19 further comprising using data produced according to the method to create a part of a video game scene.

26. (Original) The method of claim 19 further comprising using data produced according to the method within a virtual reality simulator.

27. (Original) The method of claim 19 further comprising using data produced according to the method for sports training.

28. (Original) The method of claim 19 further comprising using data produced according to the method for illustrating athletic action during a broadcast of a sporting event.

29. (Currently Amended) A method of tracking movement of an object comprising:

placing at least one transmitter on at least one object, the transmitter transmitting a radio frequency signal;

receiving and processing the signal at a plurality of radio frequency receivers;

wherein neither the transmission of the signal nor the ~~receiving of the signal~~ processing of the signal at a given receiver is controlled in time with respect to any of the other receivers;

processing ~~timings~~ phase and pseudorange measurements of the signals received at the receivers to track movement of the object.

30. (Original) The method of claim 29 wherein the movement takes place and is effectively tracked within a capture zone having horizontal dimensions of larger than 25 meters by 25 meters.

31. (Original) The method of claim 29 wherein the movement takes place and is effectively tracked within a capture zone having a diagonal dimension of at least 100 meters.

32. (Original) The method of claim 29 wherein the at least one transmitter comprises at least 1000 transmitters.

33. (Original) The method of claim 29 wherein the at least one transmitter comprises a plurality of transmitters that transmit respective waveforms which have been selected to minimize pairwise cross-correlation between transmitters.

34. (Original) The method of claim 29 wherein the transmitter transmits at a duty cycle of less than 5 percent.

35. (Currently Amended) A method of tracking movement of an object comprising:

placing a plurality of radio frequency sensors at not precisely controlled positions about a capture zone;

placing at least one reference radio frequency transmitter defining a reference tag at a not precisely controlled position within the capture zone;

~~determining a location of the marker tag with respect to the sensors;~~

placing a plurality of radio frequency transmitters defining marker tags on the object;

receiving and digitizing at the sensors signals transmitted by the reference tag and the marker tags; and

processing the signals transmitted by the reference tag and the marker tags to determine positions of the object relative to the reference tag as the object moves through the capture zone.

36. (Currently Amended) The method of claim 35 wherein the marker tags are not synchronized either with respect to each other or with respect to the reference tag, and the receiving steps performed at the sensors are not synchronized with respect to the other sensors.

37. (Original) A method of tracking movement of an object comprising:

disposing radio frequency transmitters defining respective marker tags at each of a plurality of separate positions on the object, wherein each transmitter transmits a respective waveform corresponding at least in part to a unique marker tag identification code;

receiving the transmitted waveforms, the received versions of the transmitted waveforms defining received waveforms;

associating the respective received waveforms with the respective marker tags that transmitted those waveforms without demodulating the waveforms to respective bit patterns; and

processing the respective waveforms to determine locations of the respective marker tags.

38. (Currently Amended) The method of claim 37 wherein the waveform processing includes correlating sampled values of each of the received waveforms against samples of stored tag identification codes waveforms; and

identifying a particular marker tag as the marker tag that transmitted a particular received waveform based on a high correlation between said samples of said particular received waveform and a particular stored ~~tag identification code~~ waveform.

39. (Original) The method of claim 38 wherein the correlating is performed using a digital signal processing microcircuit.

40. (Original) The method of claim 38 wherein the stored tag identification code waveforms have been filtered to approximate an idealized tag identification code waveform as it would actually be received at said sensors.

41. (Currently Amended) A method of tracking movement of an object comprising:

placing a plurality of transmitters on the object, each of the transmitters transmitting signals at a transmission rate that is an integer multiple of ~~both 24 transmissions per second and 30~~ 120 transmissions per second; and

processing the transmitted signals to track movement of the object.

42. (Original) The method of claim 41 wherein the transmission rate is 240 transmissions per second.

43.-53. (Withdrawn)

54. (Currently Amended) A method comprising:

providing at least three wireless transmitters affixed to a camera to define camera transmitters;

providing at least four wireless radio frequency receivers for receiving signals transmitted by the camera transmitters; and

processing phase information extracted from signals received from the camera transmitters to the at least four wireless radio frequency receivers to determine movement of the camera.

55. (Original) The method of claim 54 wherein the method does not involve using any electromechanical or optical sensors to determine the movement of the camera.

56. (Original) The method of claim 54 further comprising correlating the movement of the camera with computer generation of an image onto a scene recorded by the camera.

57. (Original) The method of claim 54 further comprising:

providing at least one wireless transmitter defining a reference transmitter at a stationary position; and

wherein the processing step comprises processing signals received from the camera transmitters and from the reference transmitter to determine movement of the camera.

58. (Original) The method of claim 54 wherein the transmitters are radio frequency transmitters.

59. (Original) The method of claim 54 wherein the camera is a hand held motion picture camera.

60. (Original) The method of claim 59 further comprising:

processing an image recorded by the hand held camera and signals received from the transmitters on the camera to remove camera jitter from the recorded image.

61. (Currently Amended) A system for recording a motion picture image for later processing comprising:

a movable motion picture camera;

a plurality of radio frequency transmitters affixed to the camera;

a reference transmitter not affixed to the camera;

at least four radio frequency receivers positioned about the camera; and

a first processing section for receiving signals transmitted by the transmitters and determining phase difference information relative to the respective transmitted signals as received at the receivers, and for determining from the phase difference information the movement of the camera ~~therefrom~~.

62. (Original) The system of claim 61 further comprising:

a second processing section for altering the recorded motion picture image based on said movement of the camera.

63. (Original) The system of 62 wherein the transmitters affixed to the camera do not transmit any inertial sensor data.

64. (Original) The system of claim 62 wherein the step of altering the recorded image comprises adding at least one computer generated image to the recorded image such that the movement of the camera results in corresponding changes in appearance of the computer generated image.

65. (Original) The system of claim 62 wherein the step of altering the recorded imagine comprises removing camera jitter from the recorded image.

66. (Original) A motion capture system comprising:

a plurality of wireless transmitters;

a plurality of wireless receivers;

means for determining positions of the wireless transmitters based upon timings of signals received from the transmitters by the receivers without requiring timing clocks of either the transmitters or the receivers to be synchronized.

67. (Original) A motion capture system according to claim 66 wherein at least some of the wireless transmitters are located on a movable camera.

68. (Original) A motion capture system according to claim 66 wherein:

the wireless transmitters include at least one transmitter disposed at a known location defining a reference transmitter; and

the position determining means comprises means for resolving positions of at least 100 transmitters to within 1 cm of accuracy over a capture zone having a diagonal of at least 50 meters.

69. (Original) A motion capture system according to claim 68 wherein the resolving means comprises means for resolving positions of at least 1000 transmitters to less than 1 cm of accuracy over a capture zone of at least 75 meters.

70. (Original) A motion capture system according to claim 66 wherein the position determining means includes means for mathematically canceling out transmitter clock dependent terms and receiver clock dependent terms thereby obviating a need for synchronization among transmitters and receivers.

71. (Original) A motion capture system according to claim 70 wherein:

the receivers comprise at least four receivers defining sensor receivers spaced apart from one another;

the transmitters include at least one transmitter at a known location defining a reference transmitter and a plurality of transmitters defining marker transmitters attached to at least one moving object, the moving object moving within a capture zone within a reception range of the four receivers;

and wherein the means for mathematically canceling clock dependent terms includes:

means for computing respective single difference terms between marker transmitter received signal parameters and reference transmitter received signal parameters; and

means for computing respective double differences between said single difference terms for pairs of sensor receivers.

72. (Original) The motion capture system according to claim 68 wherein the marker transmitters transmit spread spectrum signals in bursts of less than 1 % duty cycle.

73. (Original) The motion capture system according to claim 68 wherein the marker transmitters comprise a plurality of groups of marker transmitters, a first group of marker transmitters transmitting spread spectrum signals within a first frequency band, a second group of marker transmitters transmitting spread spectrum signals within a second frequency band, the first and second frequency bands being separated by a guard band.